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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,487	09/02/2003	Hyung-Soo Kim	1349.1277	2312
21171	7590	09/13/2006	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			PHAM, HAI CHI	
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DATE MAILED: 09/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/652,487	Applicant(s) KIM, HYUNG-SOO	
	Examiner Hai C. Pham	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE & Amendment (06/30/06).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7-13 and 15-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7-13 and 15-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Request For Continued Examination

1. The request filed on 06/30/06 for a Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 10/652,487 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4-5, 7-13 and 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibe (U.S. 6,489,982) in view of Mclaughlin et al. (U.S. 4,758,071) and Narisawa (U.S. 6,067,182).

Ishibe discloses a scanning optical system comprising a collimating lens (2) in which a beam emitted from a light source (semiconductor laser 1) is transformed into at least one of a convergent beam and a parallel beam with respect to an optical axis (col. 5, lines 46-50) and outputted towards a slit (aperture stop 3), the collimating lens having the following characteristics listed in Table 1 (col. 8):

- R1col = 182.212 mm (curvature radius of a first surface of the collimating lens opposing the light source)

Art Unit: 2861

- $R_{2col} = -20.831$ mm (curvature radius of a second surface of the collimating lens opposing the aperture stop)
- $d_3 = 6.00$ mm (center thickness of the collimating lens)
- $f_{col} = 24.636$ mm (focal length from the collimating lens to the light source)

such that the following relationships:

$$R_{2col} / R_{1col} = 182.212 / (-20.831) = -0.114$$

and $d_3 / f_{col} = 6.00 / 24.636 = 0.12$

amply satisfy the claimed inequalities.

However, Ishibe is silent regarding the collimator lens being made of one sheet of a spherical surface lens, the collimator lens being made of glass, and the first and second surfaces of the collimator lens having a first and a second positive constant refractive index, respectively.

Mclaughlin et al. discloses a collimator lens (1) used in an optical reading or writing system, the collimator lens being made out of a sheet of a glass (glass plate 10, Figs. 9C-D) wherein either one surface or each of the two surfaces of the lens is processed into a spherical surface having a predetermined radius of curvature and a predetermined thickness (col. 4, lines 10-25), the spherical shape of the collimator lens is preferred over the aspherical shape because an accurate measurement would be required during the process of the latter. Mclaughlin et al. further teaches the collimator lens having a first positive constant refractive index of 1.556 at its first surface and a second positive constant refractive index of 1.50 at its second surface (see Table 2A, Example 2).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the collimator lens in the device of Ishibe with a lens made out of one sheet of glass and having both surfaces of spherical shape with a different positive constant refractive index at the respective surface as taught by McLaughlin et al. The motivation for doing so would have been to provide a collimator lens easy to produce and whose spherical aberration can be reduced at a low cost as suggested by McLaughlin et al. at col. 1, lines 15-26.

Ishibe also fails to teach the magnification ratio in a main scanning direction and a magnification in a sub-scanning direction are the same (claims 1, 5, 9, 13, 17), and the collimator lens having a positive refractive power (claims 2, 7, 11, 15, 19).

Narisawa discloses an optical scanning device comprising a collimator lens (12) made of glass, which converts the light beam into a parallel beam outputted toward a slit (21), the collimator lens having a power in the main scanning direction (col. 4, lines 3-5), a cylindrical lens (11), a polygon mirror (3), and scanning lenses (15) for focusing the light beam onto the scanned surface (19), wherein the image formation optical system has an image formation magnification along the main scanning direction equal to the image formation magnification along the sub-scanning direction (see Abstract) (col. 30-37) (col. 3, line 62 to col. 4, line 8).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Ishibe to have the image formation optical system has an image formation magnification along the main scanning direction equal to the image formation magnification along the sub-scanning direction as taught

Art Unit: 2861

by Narisawa. The motivation for doing so would have been to minimize the defocus or dealignment of the light beam on the scanned surface as suggested by Narisawa.

With regard to claims 4, 8, 12, 16, 20, Ishibe further teaches the aperture stop (3) having an elliptic shape with a larger diameter (= 3.08 mm) in the main scanning direction and a shorter diameter (= 1.34 mm) in the sub-scanning direction (Table 1, col. 8, lines 50-52).

With regard to claim 17, Ishibe also teaches the scanning optical system including a cylinder lens (4) in which light beams passing therethrough, are transformed into linear shapes (col. 5, lines 50-58), a rotating polygon mirror (5), an f-theta lens (6), and a photosensitive drum (7).

Response to Arguments

4. Applicant's arguments filed 06/30/06 have been fully considered but they are not persuasive with regard to the teaching and combination of Mclaughlin with Ishibe.

First of all, Mclaughlin teaches that it is old and well known in the art to provide a collimator lens made out of a single sheet of glass, which is subsequently ground to spherical surfaces, and that the use of such single-sheet, glass collimator lens to reduce spherical aberration and coma is more economical as compared to the use of a compound lens to attain the same goal of reducing the spherical aberration and coma. Such teaching clearly reads on the claimed limitation of "a collimating lens being one sheet of a spherical surface lens". The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary

Art Unit: 2861

reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

The Applicant also argues that “[t]he Examiner is required to present actual evidence and make particular findings related to the motivation to combine the teachings of the references.” The examiner has previously provides the “actual evidence” and the “particular findings” in Mclaughlin regarding the motivation for the combination by pointing to the discussion of Mclaughlin et al. at col. 1, lines 15-26, where Mclaughlin clearly provides a motivation for using a collimating lens made out of a single sheet of glass with reduced spherical aberration for cost effective purpose as compared to the use of a compound lens consisting of plural spherical lenses.

Secondly, the amended base claims now recite the collimating lens including “a first surface ... having a first curvature radius and a first positive constant refractive index” and “a second surface ... having a second curvature radius and a second positive constant refractive index”, such limitation would imply that the refractive index of the collimating lens *varies* from one surface to the next along the thickness direction of the lens. Mclaughlin teaches that the collimator lens has a portion (1A) with varying refractive index, and provides a first positive constant refractive index of 1.556 *at* its first surface and a second positive constant refractive index of 1.50 *at* its second surface (see Table 2A, Example 2).

The Applicant also argues that the following examiner's statement ""Moreover, Ishibe teaches an error correction in the focused light beams on the surface to be scanned largely to the positional error between the scanning optical system and the scanned surface, and the error correction requires adequate positioning of the different optical components. Such focus error would be minimized with the use of a well designed/manufactured optical system" is a conclusory statement, submitted without support". However, this is not the case. The above statement from the examiner is based on the discussion of Ishibe regarding the preferred use of a glass lens over a plastic lens where "the surface precision of this [plastic] lens is inferior to that obtained by polishing optical glass" (see Ishibe, col. 2, line63 to col. 3, line 13).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vip Patel can be reached on (571) 272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2861

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



HAI PHAM
PRIMARY EXAMINER
September 9, 2006